

AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** A friction brake assembly to act between a main actuator[[,]]
and a linear shaft relatively moveable with respect to said main actuator,~~and a joint assembly~~
~~relatively pivotally coupled to said linear shaft~~, comprising:

a linear shaft configured to displace longitudinally with respect to the main
actuator;

a brake member connected to said linear shaft,

a carrier connected to said main actuator;

a friction pad attached to said carrier for removable engagement with said brake
member;

a first actuator comprising at least one shape memory alloy element, said first
actuator being operatively coupled to said carrier and actuatable to move said friction pad
into engagement with said brake member to apply a braking force on the brake member,
wherein the engagement of said friction pad with said brake member inhibits longitudinal
displacement of said linear shaft ~~and inhibits a corresponding pivoting of said joint
assembly~~;

a second actuator comprising at least one shape memory alloy element, said second
actuator operatively coupled to said carrier and actuatable to move said friction pad away
from said brake member to remove said braking force, wherein the moving away of said
friction pad from said brake member allows a longitudinal displacement of said linear shaft
~~and a corresponding pivoting of said joint assembly~~; and

a control circuit to operate selectively said first and second actuator,

wherein the first and second actuators are configured to change in length only
when an electric current is applied thereto such that the length of the first and second
actuators remains unchanged upon removal of the current, thereby allowing the friction
pad and brake member to remain in a stable position without the continued application of
electrical power to the first and second actuators.

2. **(Previously Presented)** A friction brake assembly according to claim 1 wherein a
resilient element is interposed between said first actuator and said carrier to maintain a bias
against said brake member.

3. **(Previously Presented)** A friction brake assembly according to claim 2 wherein said resilient element is a beam projection from said carrier.

4. **(Cancelled)**

5. **(Previously Presented)** A friction brake assembly according to claim 1 wherein said shape memory alloy elements are tensile elements and said control circuit changes the length of said elements to actuate said brake.

6. **(Previously Presented)** A friction brake assembly according to claim 5 wherein said control circuit supplies an electrical current to respective ones of said elements to change the length thereof.

7. **(Previously presented)** A friction brake assembly according to claim 1 wherein said brake member is a drum rotatably mounted on said main actuator and said carrier is pivotally secured to said first and second actuators for movement into or out of engagement with said drum.

8. **(Previously presented)** A friction brake assembly according to claim 7 wherein said carrier includes a third member extending radially relative to said drum and said first and second actuators act between said linear shaft and said third member.

9. **(Previously presented)** A friction brake assembly according to claim 8 wherein said third member is a flexible beam to couple resiliently said first and second actuators to said carrier.

10. **(Previously presented)** A friction brake assembly according to claim 8 wherein said first and second actuators are tensile members formed from a shape memory alloy.

11. **(Previously presented)** A friction brake assembly according to claim 10 wherein each of said first and second actuators includes a plurality of tensile members arranged in parallel.

12. **(Previously Presented)** A friction brake assembly according to claim 11 wherein said tensile members are electrically connected in series and a current passing through said tensile members effects foreshortening of said tensile members.

13. **(Previously Presented)** A friction brake assembly according to claim 7 wherein said carrier is pivotally mounted for movement about an axis parallel to but spaced from the axis of rotation of said drum.

14. **(Withdrawn)** A prosthesis having a pair of limbs pivotally connected on one another by a mechanical joint, an actuator connected between said limbs to effect relative rotation there between and a friction brake assembly as claimed in claim 1 acting to inhibit such relative motion, said friction brake assembly being operative upon said actuator to inhibit further movement in said joint.

15. **(Withdrawn)** A prosthesis according to claim 14 wherein said actuator includes a pair of relatively displaceable components to change the length of said actuator and said friction brake assembly acts between said displaceable components.

16. **(Withdrawn)** A prosthesis according to claim 15 wherein said components are interconnected by a screw thread such that relative rotation there between causes a change in the length of said actuator and said friction brake assembly acts to inhibit relative rotation.

17.-20. **(Cancelled)**

21. **(Withdrawn)** A prosthesis according to claim 14 wherein a resilient element is interposed between said first friction brake assembly actuator and said carrier to maintain a bias against said brake member.

22. **(Withdrawn)** A prosthesis according to claim 21 wherein said resilient element is a beam projection from said carrier.

23. **(Withdrawn)** A prosthesis according to claim 14 wherein said shape memory alloy elements are tensile elements and said controller changes the length of said elements to actuate said brake.

24. **(Withdrawn)** A prosthesis according to claim 23 wherein said controller supplies an electrical current to respective ones of said elements to change the length thereof.

25. **(Withdrawn)** A prosthesis according to claim 14 wherein said brake member is a drum rotatably mounted on said other member first component and said carrier is pivotally secured to said friction brake assembly actuators for movement into or out of engagement with said drum.

26. **(Withdrawn)** A prosthesis according to claim 25 wherein said carrier includes a member extending radially relative to said drum and said friction brake assembly actuators and act between spaced locations on said other member second component and said member, respectively.

27. **(Withdrawn)** A prosthesis according to claim 26 wherein said member is a flexible beam to couple resiliently said friction brake assembly actuators to said carrier.

28. **(Withdrawn)** A prosthesis according to claim 26 wherein said friction brake assembly actuators are tensile members formed from a shape memory alloy.

29. **(Withdrawn)** A prosthesis according to claim 28 wherein each of said friction brake assembly actuators includes a plurality of tensile members arranged in parallel.

30. **(Withdrawn)** A prosthesis according to claim 29 wherein said tensile members are electrically connected in series and a current passing through said tensile members effects foreshortening of said tensile members.

31. **(Withdrawn)** A prosthesis according to claim 25 wherein said carrier is pivotally mounted for movement about an axis parallel to but spaced from the axis of rotation of said drum.

32. **(New)** A friction brake assembly to act between a main actuator and a linear shaft relatively moveable with respect to said main actuator, comprising:

a linear shaft;

a brake member connected to said linear shaft,

a carrier connected to said main actuator;

a friction pad attached to said carrier for removable engagement with said brake member;

a first actuator comprising a plurality of shape memory alloy rods arranged in parallel, said first actuator being operatively coupled to said carrier and actuatable to move said friction pad into engagement with said brake member to apply a braking force on the brake member, wherein the engagement of said friction pad with said brake member inhibits movement of said linear shaft;

a second actuator comprising a plurality of shape memory alloy rods arranged in parallel, said second actuator operatively coupled to said carrier and actuatable to move said friction pad away from said brake member to remove said braking force, wherein the moving away of said friction pad from said brake member allows movement of said linear shaft; and

a control circuit to operate selectively said first and second actuator,

Application No.: 10/553579
Filing Date: April 20, 2006

wherein the first and second actuators are configured to change in length only when an electric current is applied thereto such that the length of the first and second actuators remains unchanged upon removal of the current, thereby allowing the friction pad and brake member to remain in a stable position without the continued application of electrical power to the first and second actuators.